Please provide the following information, and submit to the NOAA DM Plan Repository.

Reference to Master DM Plan (if applicable)

As stated in Section IV, Requirement 1.3, DM Plans may be hierarchical. If this DM Plan inherits provisions from a higher-level DM Plan already submitted to the Repository, then this more-specific Plan only needs to provide information that differs from what was provided in the Master DM Plan.

URL of higher-level DM Plan (if any) as submitted to DM Plan Repository:

1. General Description of Data to be Managed

1.1. Name of the Data, data collection Project, or data-producing Program:
2012 MN DNR Lidar: Duluth Post-Flood

1.2. Summary description of the data:
The Minnesota Elevation mapping project was developed by the Minnesota Digital Elevation Mapping Committee and executed by Minnesota State agencies with the assistance of the federal government county governments to acquire a highly accurate land surface elevation dataset for the State of Minnesota. High accuracy elevation data are essential to improving water quality, improving disaster preparedness, protecting existing infrastructure, planning flood and drought damage mitigation reports, enhancing natural resource protection, and strengthening decision-making capacity at all levels of government.

This project was funded by the Minnesota Clean Water Legacy Act in 2009 the project is expected to conclude in 2013.

Woolpert, a vendor on the Minnesota LiDAR Master Contract, has been selected to provide LiDAR services for Work Order #7- Minnesota Duluth Flood Area LiDAR Acquisition.

LiDAR data are in UTM Zone 15 coordinate system, NAD83 NAVD88 Geoid09 meters tiled by USGS 1/16, 1;24,000 quadrangles. Data provided include:

1) One meter digital elevation model

2) Edge-of-water breaklines

3) Classified LAS formatted point cloud data

The NOAA Office for Coastal Management (OCM) downloaded 964 laz files from ftp://ftp.gisdata.state.mn.us/pub/data/elevation/lidar/projects/duluth_fall_2012/ and processed the data to the Data Access Viewer (DAV) and to https.

1.3. Is this a one-time data collection, or an ongoing series of measurements?
One-time data collection

1.4. Actual or planned temporal coverage of the data:
2012-10-29, 2012-10-30, 2012-10-31, 2012-11-02, 2012-11-08

1.5. Actual or planned geographic coverage of the data:
W: -93.159909, E: -91.551944, N: 47.441972, S: 46.334511

1.6. Type(s) of data:
(e.g., digital numeric data, imagery, photographs, video, audio, database, tabular data, etc.)
Model (digital)

1.7. Data collection method(s):
(e.g., satellite, airplane, unmanned aerial system, radar, weather station, moored buoy, research vessel, autonomous underwater vehicle, animal tagging, manual surveys, enforcement activities, numerical model, etc.)

1.8. If data are from a NOAA Observing System of Record, indicate name of system:

1.8.1. If data are from another observing system, please specify:

2. Point of Contact for this Data Management Plan (author or maintainer)

2.1. Name:
NOAA Office for Coastal Management (NOAA/OCM)

2.2. Title:
Metadata Contact

2.3. Affiliation or facility:
NOAA Office for Coastal Management (NOAA/OCM)

2.4. E-mail address:
coastal.info@noaa.gov

2.5. Phone number:
(843) 740-1202

3. Responsible Party for Data Management
Program Managers, or their designee, shall be responsible for assuring the proper management of the data produced by their Program. Please indicate the responsible party below.

3.1. Name:

3.2. Title:
Data Steward

4. Resources

Programs must identify resources within their own budget for managing the data they produce.

4.1. Have resources for management of these data been identified?
Yes

4.2. Approximate percentage of the budget for these data devoted to data management (specify percentage or "unknown"):
Unknown

5. Data Lineage and Quality
NOAA has issued Information Quality Guidelines for ensuring and maximizing the quality, objectivity, utility, and integrity of information which it disseminates.

5.1. Processing workflow of the data from collection or acquisition to making it publicly accessible
(describe or provide URL of description):

Lineage Statement:

NOAA OCM downloaded the laz files from the MN DNR Lidar site (ftp://ftp.gisdata.state. mn.us/pub/data/elevation/lidar/projects/duluth_fall_2012/)

Process Steps:

- 2012-10-29 00:00:00 - Using Light Detection And Ranging (LiDAR) systems, 154 flight lines of high density data, at a nominal pulse spacing (NPS) of 1.5 meter, were collected over Minnesota counties of Lake, St Louis, Aitkin, Carlton, and Pine (approximately 3,078 sq. miles), along with a 100 meter buffer beyond the project tile boundary. Multiple returns were recorded for each laser pulse along with an intensity value for each return. A total of eleven (11) missions were flown from October 29, 2012 through Novembe 08, 2012. A minimum of three (3) airborne global positioning system (GPS) base stations were used in support of the LiDAR data acquisition. All data for this task order is referenced to UTM 15N, NAD83, NAVD88, in meters. Airborne GPS data was differentially processed and integrated with the post processed IMU data to derive a smoothed best estimate of trajectory (SBET). The SBET was used to reduce the LiDAR slant range measurements to a raw reflective surface for each flight line. The coverage was classified to extract a bare earth digital elevation model (DEM) and separate last returns. In addition to the LAS deliverables, one layer of coverage were delivered in the ArcGrid binary format: bare-earth.

System Parameters for 1.5 NPs: ALS70 Specifications Post Spacing (Minimum): 4.92 ft / 1.5 m AGL (Above Ground Level) average flying height: 7,799 ft / 2,377.1 m MSL (Mean Sea Level) average flying height: 8,392 ft / 2,557.9m Average Ground Speed: 150 knots / 172.6 mph Field of View (full): 40 degrees Pulse Rate: 115 kHz Scan Rate: 25 Hz Side Lap (Minimum): 25%

Optech ALTM Gemini Specifications Post Spacing (Minimum): 4.92 ft / 1.5 m AGL (Above Ground Level) average flying height: 6,800 ft / 2,072.6 m MSL (Mean Sea Level) average flying height: 7,400 ft / 2255.5 m Average

Ground Speed: 150 knots / 172.6 mph Field of View (full): 40 degrees Pulse Rate: 100 kHz Scan Rate: 29 Hz Side Lap (Minimum): 25%

- 2012-01-01 00:00:00 - The ALS70 and Optech Gemini calibration and system performance is verified on a periodic basis using Woolpert's calibration range. The calibration range consists of a large building and runway. The edges of the building and control points along the runway have been located using conventional survey methods. Inertial measurement unit (IMU) misalignment angles and horizontal accuracy are calculated by comparing the position of the building edges between opposing flight lines. The scanner scale factor and vertical accuracy is calculated through comparison of LiDAR data against control points along the runway. Field calibration is performed on all flight lines to refine the IMU misalignment angles. IMU misalignment angles are calculated from the relative displacement of features within the overlap region of adjacent (and opposing) flight lines. The raw LiDAR data is reduced using the refined misalignment angles.

- 2012-11-11 00:00:00 - Once the data acquisition and GPS processing phases are complete, the LiDAR data was processed immediately to verify the coverage had no voids. The GPS and IMU data was post processed using differential and Kalman filter algorithms to derive a best estimate of trajectory. The quality of the solution was verified to be consistent with the accuracy requirements of the project.

- 2012-10-30 00:00:00 - The individual flight lines were inspected to ensure the systematic and residual errors have been identified and removed. Then, the flight lines were compared to adjacent flight lines for any mismatches to obtain a homogenous coverage throughout the project area. The point cloud underwent a classification process to determine bare-earth points and non-ground points utilizing "first and only" as well as "last of many" LiDAR returns. This process determined The LiDAR LAS files for this task order have been classified into the Default (Class 1), Ground (Class 2), Low Vegetation (Class 3), Medium Vegetation (Class 4), High Vegetation (Class 5) Buildings (Class 6), Noise (Class 7), Model Keypoints (Class 8), Water (Class 9), Ignored Ground(Class 10), bridges (Class 14), and Overlap (Class 17) classifications.   The bare-earth (Class 2 - Ground) LiDAR points underwent a manual QA/QC step to verify that artifacts have been removed from the bare-earth surface. The surveyed ground control points are used to perform the accuracy checks and statistical analysis of the LiDAR dataset.

- 2020-04-03 00:00:00 - The NOAA Office for Coastal Management (OCM) downloaded 964 laz files from ftp://ftp.gisdata.state.mn.us/pub/data/elevation/lidar/projects/duluth_fall_2012/   The files contained elevation and intensity measurements for the Duluth Post-Flood project area. The data were in UTM 15, NAD83, meters coordinates and NAVD88 (Geoid09) elevations in meters. The data were classified as: 1 - Unclassified, 2 - Ground, 3 - Low Veg, 4 - Medium Veg, 5 - High Veg, 6 - Buildings, 7 - Noise, 8 - Model Keypoint, 9 - Water, 10 - Ignored Ground, 14 - Bridge Decks, 17 - Overlap. The NOAA Office for Coastal Management processed all classifications of points to the Digital Coast Data Access Viewer (DAV). Classes available on the DAV are: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 14, 17.   OCM performed the following processing on the data for Digital Coast storage and provisioning purposes: 1. An internal OCM

script was run to check the number of points by classification and by flight ID and the gps and intensity ranges.   2. Internal OCM scripts were run on the laz files to convert from orthometric (NAVD88) elevations to ellipsoid elevations using the Geoid09 model, to convert from UTM 15, NAD83, meters coordinates to geographic coordinates, to assign the geokeys, to sort the data by gps time and zip the data to database and to http.

5.1.1. If data at different stages of the workflow, or products derived from these data, are subject to a separate data management plan, provide reference to other plan:

5.2. Quality control procedures employed (describe or provide URL of description):

6. Data Documentation

The EDMC Data Documentation Procedural Directive requires that NOAA data be well documented, specifies the use of ISO 19115 and related standards for documentation of new data, and provides links to resources and tools for metadata creation and validation.

6.1. Does metadata comply with EDMC Data Documentation directive?
No

6.1.1. If metadata are non-existent or non-compliant, please explain:
Missing/invalid information:
- 1.7. Data collection method(s)
- 3.1. Responsible Party for Data Management
- 5.2. Quality control procedures employed
- 7.1.1. If data are not available or has limitations, has a Waiver been filed?
- 7.4. Approximate delay between data collection and dissemination
- 8.3. Approximate delay between data collection and submission to an archive facility

6.2. Name of organization or facility providing metadata hosting:
NMFS Office of Science and Technology

6.2.1. If service is needed for metadata hosting, please indicate:

6.3. URL of metadata folder or data catalog, if known:
https://www.fisheries.noaa.gov/inport/item/59235

6.4. Process for producing and maintaining metadata
(describe or provide URL of description):
Metadata produced and maintained in accordance with the NOAA Data Documentation Procedural Directive: https://nosc.noaa.gov/EDMC/DAARWG/docs/EDMC_PD-Data_Documentation_v1.pdf

7. Data Access
NAO 212-15 states that access to environmental data may only be restricted when distribution is explicitly limited by law, regulation, policy (such as those applicable to personally identifiable information or protected critical infrastructure information or proprietary trade information) or by security requirements. The EDMC Data Access Procedural Directive contains specific guidance, recommends the use of open-standard, interoperable, non-proprietary web services, provides information about resources and tools to enable data access, and includes a Waiver to be submitted to justify any approach other than full, unrestricted public access.

7.1. Do these data comply with the Data Access directive?
Yes

7.1.1. If the data are not to be made available to the public at all, or with limitations, has a Waiver (Appendix A of Data Access directive) been filed?

7.1.2. If there are limitations to public data access, describe how data are protected from unauthorized access or disclosure:

7.2. Name of organization of facility providing data access:
NOAA Office for Coastal Management (NOAA/OCM)

7.2.1. If data hosting service is needed, please indicate:

7.2.2. URL of data access service, if known:
https://coast.noaa.gov/dataviewer/#/lidar/search/where:ID=9075
https://coast.noaa.gov/htdata/lidar1_z/geoid18/data/9075

7.3. Data access methods or services offered:
Data are available online for bulk and custom downloads.

7.4. Approximate delay between data collection and dissemination:

7.4.1. If delay is longer than latency of automated processing, indicate under what authority data access is delayed:

8. Data Preservation and Protection
The NOAA Procedure for Scientific Records Appraisal and Archive Approval describes how to identify, appraise and decide what scientific records are to be preserved in a NOAA archive.

8.1. Actual or planned long-term data archive location:
(Specify NCEI-MD, NCEI-CO, NCEI-NC, NCEI-MS, World Data Center (WDC) facility, Other, To Be Determined, Unable to Archive, or No Archiving Intended)
NCEI_CO

8.1.1. If World Data Center or Other, specify:

8.1.2. If To Be Determined, Unable to Archive or No Archiving Intended, explain:

8.2. Data storage facility prior to being sent to an archive facility (if any):
Office for Coastal Management - Charleston, SC

8.3. Approximate delay between data collection and submission to an archive facility:

8.4. How will the data be protected from accidental or malicious modification or deletion prior to receipt by the archive?
Discuss data back-up, disaster recovery/contingency planning, and off-site data storage relevant to the data collection
Data is backed up to tape and to cloud storage.

9. Additional Line Office or Staff Office Questions
Line and Staff Offices may extend this template by inserting additional questions in this section.